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STEAMING BLACK WALNUT LUMBER TO DARKEN THE SAPWOOD

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In commercial practice, black walnut lumber is usually steamed before it is seasoned, mainly to darken the sapwood. Some manufacturers think that it also improves the color of the heartwood. The sapwood of steamed lumber seldom becomes fully as dark as the heartwood, however, and additional staining is often required in finished products. The bright sapwood of unsteamed lumber, especially air-dried lumber, requires greater skill and care in staining. For this reason buyers usually demand steamed walnut lumber for general use.

The exact reason why the sapwood is darkened during steaming is not definitely known, but it is probable that most of the darkening is a result of chemical action within the sapwood due to high temperatures and high relative humidities, and that leaching of color from the heartwood is relatively unimportant.

The general practice is to construct a vat or pit of suitable size, with an open or perforated steam supply pipe leading into the bottom. The pipe should be extended and framed or boxed in, so as to obtain good distribution of steam through the pile. Planking or concrete may be used in making the vat. Concrete is preferable, because wood deteriorates rapidly under the conditions of temperature and humidity that prevail.

The lumber is commonly solid piled in the vat and covered with sawdust, after which steam is admitted into the bottom area. Some openings between layers of the pile, such as may be obtained by using thin stickers or lath, may be desirable to help bring about more uniform circulation of steam throughout the pile to produce more uniform darkening. The usual practice for common thicknesses of lumber is to steam for periods of two to four days. Longer periods seem to have no appreciable advantage, and would only contribute to loss of strength and a greater tendency to honeycomb in subsequent kiln drying. Seasoning degrade and loss in strength properties, especially toughness, may also be serious if the average temperature in the steaming vat exceeds about 180° F., and for this reason low-pressure or exhaust steam should be used. Such steam has more moisture per unit of heat liberated and, therefore, higher humidities and lower temperatures are obtainable.

After the steaming treatment, the stock is allowed to cool in place or is cooled by spraying it with water before it is removed from the vat and

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piled for air seasoning or kiln drying. Immediate exposure of the hot, wet lumber to relatively cold air may initiate surface checking or end splitting. Such defects occur because of the low relative humidity conditions produced at the board surface as the heat leaves the lumber.

To save handling costs, the green lumber may be piled on kiln trucks or pallets and steamed in the dry kiln or in a special steaming compartment by using a temperature of about 160° to 180° F. with a very high relative humidity. This procedure, however, is somewhat less effective than steaming in a vat. Most kilns are unable to maintain sufficiently high relative humidities at such high temperatures to darken the sapwood to the desired degree without excessive loss of steam; therefore, the practicality of steaming in a kiln is doubtful. Moreover, steaming at elevated temperatures may damage the kiln if regularly done. For these reasons, steaming of stickered stock should be done in a separate compartment built specially tight and of durable material. Following steaming and cooling in this compartment, lumber on kiln trucks or pallets can be moved directly into the kiln or to the air seasoning yard for drying.

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